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Water Supply Outlook For Washington



SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

Cooperating with

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

AS OF
MAR. 1, 1979

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: VIEW OF A SNOTEL DATA SITE IN THE SNOWY RANGE IN WYOMING. TALL CYLINDRICAL DEVICE IS A PRECIPITATION GAGE. SNOW PILLOWS ON THE GROUND NOT VISIBLE DUE TO SNOW COVER. SHELTER HOUSE, ANTENNA TOWER, ANTENNA, AND TEMPERATURE UNIT ARE VISIBLE BEHIND THE PRECIPITATION GAGE.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, 230 N. First Ave., Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno, Nevada 89505
Oregon	1220 S. W. Third Ave., Portland, Oregon 97204
Utah	4420 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U. S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Snow Surveys Branch, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.



WATER SUPPLY OUTLOOK FOR WASHINGTON

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

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SPOKANE, WASHINGTON

In Cooperation with

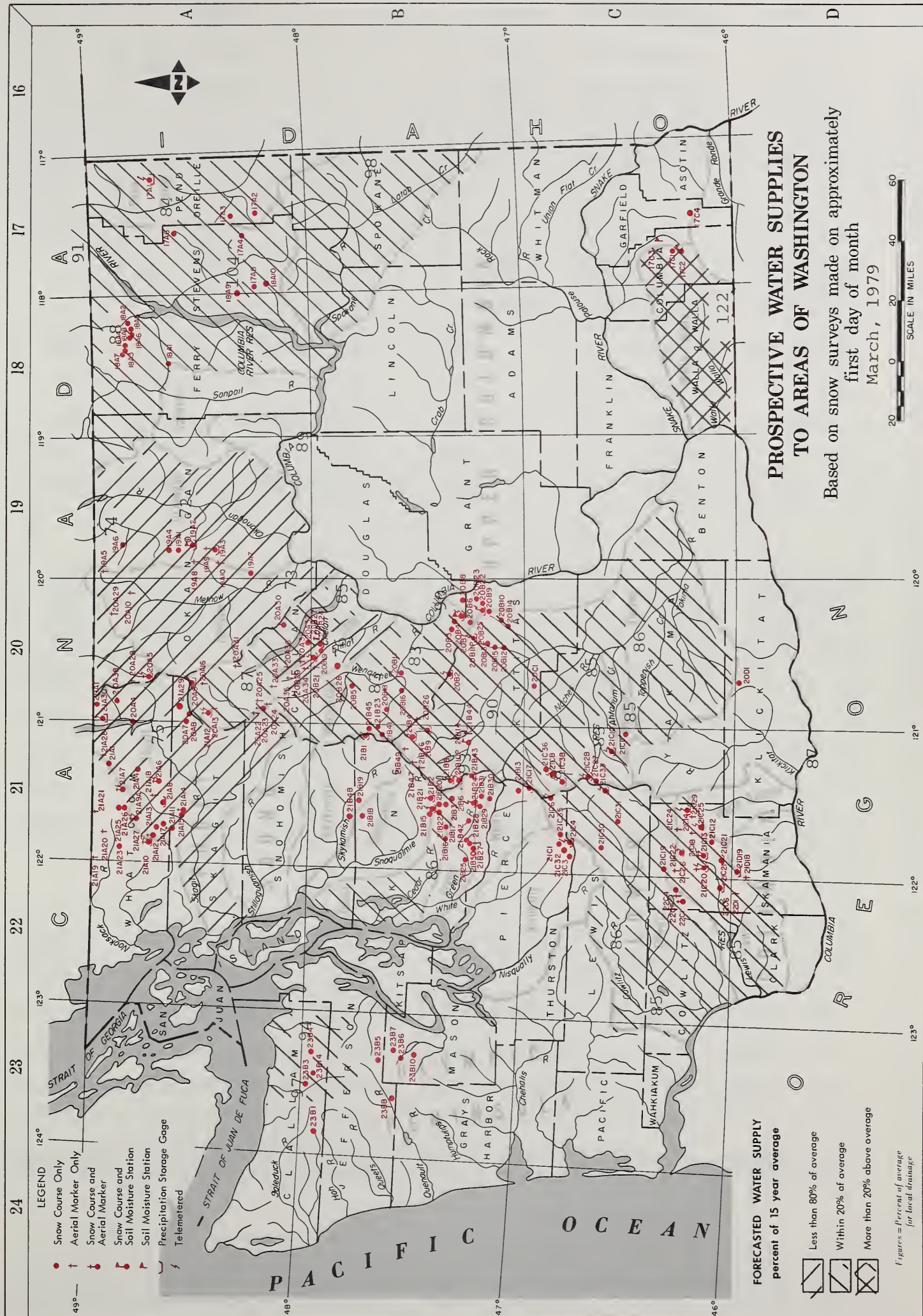
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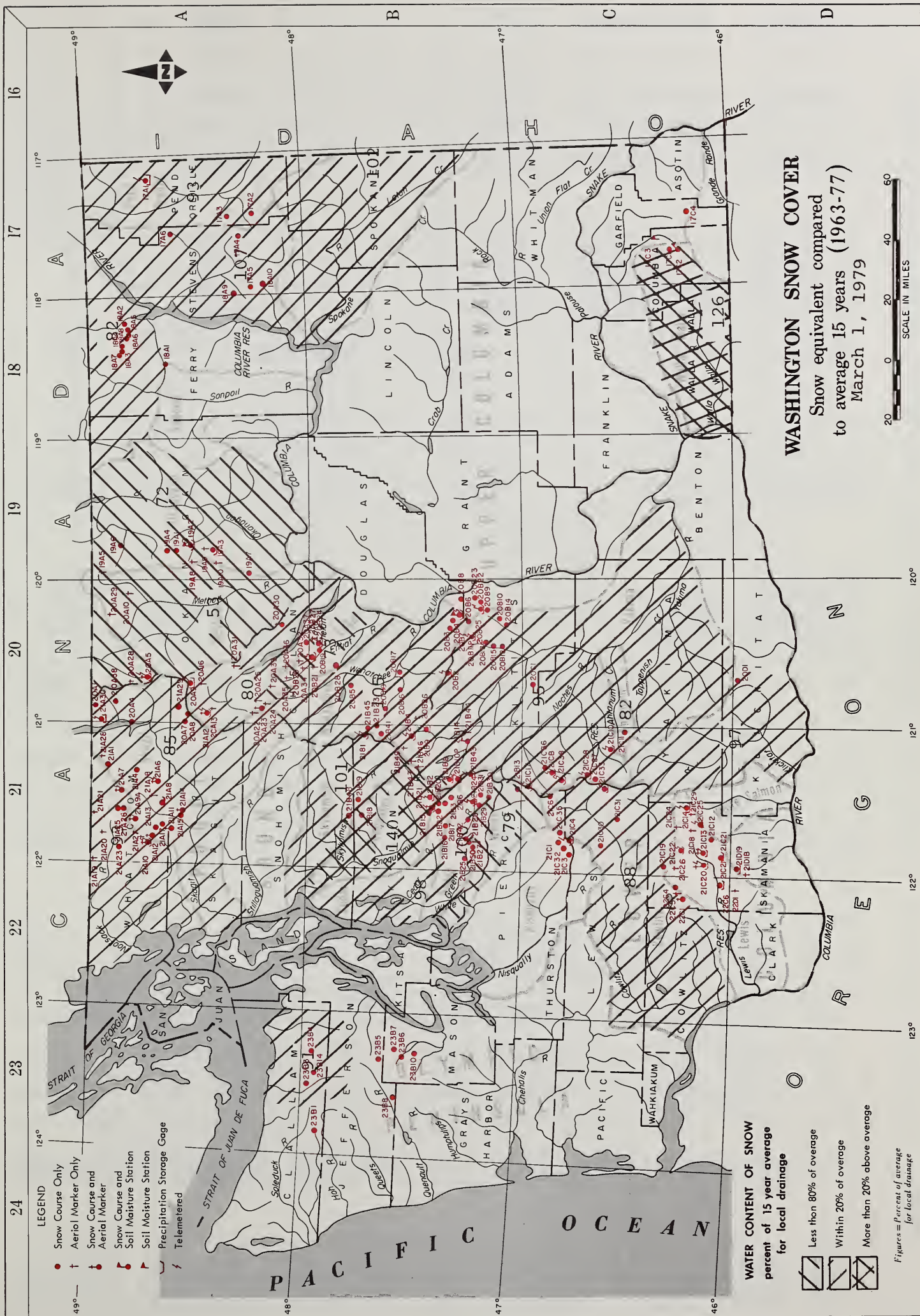
**ROBERT T. DAVIS, Snow Survey Supervisor
and
NORINE P. KENT, Statistical Assistant**

SOIL CONSERVATION SERVICE
360 U.S. COURTHOUSE
SPOKANE, WASHINGTON 99201



INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE										LOWER COLUMBIA DRAINAGE										PUGET SOUND DRAINAGE										OLYMPIC PENINSULA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Bayer Mountain	17A2	7	31N	43E	5250	Calacum Creek Upper	20822	11	20N	20E	5300	Lane Pine Shelter	21C26P	8	9N	7E	3800	Beaver Creek Trail	21A4	35	39N	12E	2200	Bald Mountain	21A19a	7	40N	7E	4400																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Bunchgrass Meadow	17A1P	24	37N	44E	5000	Calacum Creek Lower	20823	1	20N	20E	4300	Matble Mountain	22C5a	24	8N	5E	3200	Beaver Pass	21A1	9	39N	12E	3680	Canyon	21A20a	20	40N	8E	5100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Winchester Creek	17A3	30	33N	43E	2970							New Muddy River	22C6P	36	8N	6E	2000	Brown Top	21A28a	26	40N	12E	5900	Glacier Creek	21A23	9-10	38N	7E	3700																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Boulder Road	18A2	36	39N	36E	1450	Beehive Springs	2083	12	21N	19E	4400	Oldman Pass	22D1a	35	6N	7E	3100	Freezeout Creek Trail	20A4	34	38N	16E	5900	Cox Valley	23B14	31	29N	6W	4500																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Butte Creek	18A3	28	39N	35E	4070	Scout-A-Vista	2084	18	21N	20E	3400	Smith Creek Road	22C1a	29	9N	6E	2100	Freezeout Meadows (New)	20A38	14	40N	14E	3500	Hurricane	23B3	36	29N	7W	4500																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Cabin Creek	18A8	5	38N	36E	3170							Spencer Meadow	21C20aP	16	8N	7E	3400	Granite Creek	20A29	25	36N	16E	3500	Skakomish River										Black and White Lakes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Goat Creek	18A4	26	39N	35E	3595	Jump-Off	2088	34	21N	20E	4450	Surprise Lakes	21C13AP	14	7N	8E	4250	Freezeout Meadows (New)	20A38	25	36N	16E	3500	Four Stream	23B10	1	23N	6W	3000	Snow Sweet Home										Black and White Lakes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Snow Caps Creek	18A5	3	38N	36E	2150	Stemilt Slide	2086	30	21N	20E	5000	Table Mountain	21C13AP	14	7N	8E	4250	Freezeout Meadows (New)	20A38	25	36N	16E	3500	Sundown Pass	23B8	25	24N	7W	3900	Soloduck River										Deer Lake																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Snow Caps Trail	18A6	5	38N	36E	2720	Upper Wheeler	2087PM	30	21N	20E	4400	Timbered Peak	21D18a	36	6N	6E	3000	Meadows Cabins	20A7	19	40N	14E	2800	Deer Lake	23B1	14	28N	9W	3900	Snow Pillow										Snow Course Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Summit G. S.	18A7	20	39N	35E	4600													New Hazmeen Lake	21A30P	10	35N	14E	4200	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Baird	17A6	19	36N	42E	3215	Yakima River	21C11	24	12N	14E	3100	Cayuse Pass	21C6	15	16N	10E	5300	Baker Pass	21A27a	1	37N	7E	4900	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Carlson	18A9	34	32N	38E	2885	Big Boulder Creek	21B9P	35	23N	14E	3200	Masquitta Meadows	21C19	33	10N	7E	4100	Duck Butte	21A11A	8	36N	8E	3800	Snow Course And Aerial Marker										Snow Course And Soil Moisture Station																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Chevelish	17A4	11	32N	41E	4925	Bumping Lake	21C8P	23	16N	12E	3450	Ohanapecoh	21C32	28	15N	7E	2200	Easy Pass	21A7A	19	39N	11E	5200	Snow Course And Soil Moisture Station										Snow Course And Soil Moisture Station																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Stranger Mountain	18A4	26	39N	35E	3595	Bumping Lake New	21C36	13	16N	12E	3450	Packwood Lake	21C31	21	13N	10E	2870	Jasper Pass	21A6A	17	38N	11E	5400	Snow Course And Soil Moisture Station										Snow Course And Soil Moisture Station																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Toga	18A10	6	29N	38E	3370	Bumping Ridge	21C38P	9	15N	12E	4600	Pigtail Peak	21C33P	11	13N	11E	5900	Kamo Kulshan	21A17	31	37N	9E	800	Snow Course And Soil Moisture Station										Snow Course And Soil Moisture Station																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Sherman Creek Pass	18A1	19	36N	35E	5350	Calacum Pass	2089	25	20N	20E	5370	Potato Hill	21C14P	36	10N	10E	4500	Marten Lake	21A9A	23	38N	8E	3600	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Clark	19A8a	2	36N	23E	7000	Cooke Creek	20810	17	19N	20E	4123	Willamee Creek	21C30	3	13N	8E	3250	Mount Blum	21A18a	27	38N	10E	5800	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Muckamuck	19A9a	20	36N	24E	6750	Damery Flat	21B44m	28	24N	14E	3271							Rocky Creek	21A12AP	20	37N	8E	2100	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Murtan Creek No. 1	19A1	30	37N	24E	5700	Fish Lake	21B4P	15	20N	14E	3271							Schreibers Meadow	21A10AP	18	37N	8E	3400	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Murtan Creek No. 2	19A4	19	37N	24E	6000	Green Lake	20811P	29	21N	19E	5385							S. F. Thunder Creek	21A14A	20	36N	9E	2200	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Paydaylen	20A28a	32	40N	18E	4300	Grause Camp	20812P	32	23N	19E	2930							Sulphur Creek	21A13	22	37N	8E	1600	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Rusty Creek	19A3P	18	35N	24E	4000	High Creek	20812	24	23N	12E	4624							Three Mile Creek	21A15	18	36N	9E	1600	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Salman Meadows	19A2PM	33	37N	24E	4500	Joe Lake	21B14M	15	20N	14E	2200							Watson Lakes	21A8P	25	37N	9E	4500	Snow Course Only										Aerial Marker Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Starvation Mtn.	19A2PM	33	37N	24E	4500	Lemah Creek	20814	4	20N	19E	3875																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														



WATER SUPPLY OUTLOOK

State of Washington

March 1, 1979

* There has been a dramatic change in the water supply outlook *
* in the state of Washington and tributary basins since the *
* first of February. The snow pack has increased nearly *
* 30 percent throughout the area. Snow cover at the current *
* time ranges from a low of 47 percent below normal to a high *
* of 40 percent above and the forecasts have all been raised *
* accordingly, although not to the same extent. The low eleva- *
* tion snow pack is still better, percentagewise, than the high *
* elevation snow pack; but with the current warming trend, this *
* should change dramatically during the month of March. *
* Rainfall, which had been subnormal all winter, was well above *
* normal - ranging from 11 to 75 percent greater than average. *
* The storm pattern which started on February 3 continued most *
* of the month and is the reason for this great improvement in *
* water supply. *
* *

SNOW COVER

Last month we had a snow pack that ranged from 76 percent below normal to 30 percent below normal in the Upper Columbia Basin. This range now is from 47 percent below normal to 5 percent above. This amount of increase is greater than any that can be recalled in the recent history of the Snow Survey Program. As stated above, the low elevation snow packs still have a greater amount of water, percentagewise, than at the upper elevations and this is dramatically shown in the Snoqualmie River Drainage. Four snow courses were measured in this area. The three high elevation snow courses have an average water equivalent that is near normal, but the one low elevation snow course now stands at 169 percent greater than average. Although there is not as much water at this location, it accounts for a greater area of the watershed. The basin average is 40 percent above normal. A similar situation is in the Lower Columbia Drainage in the Mill Creek Watershed. The three snow courses in this area indicate the snow pack to be 26 percent above normal. Over the Olympic Peninsula, the snow pack is 85 percent of normal.

RESERVOIRS

The irrigation reservoirs in the Yakima Basin have less water in storage now than at any time since 1970; but with the expected runoff, these reservoirs should fill. The two small reservoirs in the Okanogan area, Conconully and Salmon Lake, both have well above normal amounts of water in storage and are in excellent shape for this time of year. The power reservoirs are not quite as good; but, with careful management and conservation of water, the expected runoff should fill these reservoirs.

PRECIPITATION

As stated previously, winter rainfall has been well below normal since the first of November. The trend has reversed in February. Precipitation in the Columbia Drainage Division above Castlegar was reported 77 percent above normal; north-eastern Washington was 75 percent above, while the southeastern portion was 62 percent above. The eastern slopes of the Cascades had precipitation that was only 11 percent above normal. This was the lowest increase in the state. On the western slopes of the Cascades, precipitation ranged from 37 to 56 percent greater than average.

STREAMFLOW

In spite of this above normal precipitation, river flows were generally subnormal during the month of February. Only the Green, Palouse, Walla Walla, and Cowlitz Rivers experienced above average outflows. Forecasts of streamflow now range from a low of 65 percent of normal to a high of 22 percent above normal. This is a 10 to 15 percent, overall, increase from that which was reported last month. Numerical forecasts can be found following this narrative.

STREAMFLOW FORECASTS - FEBRUARY 1979

The following summarized runoff forecasts are based principally on mountain snow-cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts. Streamflow figures for 1978 are preliminary and subject to revision.

Basin, Stream and Station	Forecast Runoff 1979	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-yr. Avg.	Fore- cast period	1978	1977	1976	15-Yr Average 63-77
<u>COLUMBIA BASIN</u>							
<u>COLUMBIA RIVER SYSTEM</u> **							
Columbia River	41400	91	Apr-Sept	44008	31562	53969	45502
at Birchbank <u>1/</u>	33100	91	Apr-July	34030	23812	38930	36353
	23800	91	Apr-June	24082	18026	25889	26194
Columbia River	60300	89	Apr-Sept	66868	41056	81878	68012
at Grand Coulee <u>1/</u>	50700	89	Apr-July	54559	32018	63543	57035
	39400	89	Apr-June	41585	25623	47065	44273
Columbia River	66300	90	Apr-Sept	72892	43415	87384	73935
bl. Rock Island Dam <u>1/</u>	56300	90	Apr-July	60163	34253	68404	62462
	43600	90	Apr-June	46242	27563	50696	48489
Columbia River	89700	87	Apr-Sept	101055	54092	120643	103493
At The Dalles, OR <u>1/</u>	77000	87	Apr-July	84815	42940	97836	88519
	62000	87	Apr-June	67353	35524	77318	71237
<u>PEND OREILLE RIVER SYSTEM</u> **							
Pend Oreille River	13400	84	Apr-Sept	15581	4130	16946	15950
bl. Box Canyon	12300	84	Apr-July	14080	2715	15271	14690
	9900	84	Apr-June	11750	2261	11814	11760
<u>KETTLE RIVER SYSTEM</u>							
Kettle River	1620	88	Apr-Sept	-	1145	2434	1846
nr. Laurier	1530	87	Apr-July	-	1105	2112	1754
	1340	85	Apr-June	1629	1037	1826	1588
Colville River	140	104	Apr-Sept	-	26	123	134
at Kettle Falls	130	106	Apr-July	-	22	106	123
	120	104	Apr-June	-	20	98	115

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

** Forecasts made by National Weather Service, River Forecast Center, Portland, OR.

Basin, Stream and Station	Forecast Runoff 1979	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	1978	1977	1976	15-Yr 63-77
<u>SPOKANE RIVER SYSTEM ***</u>							
Spokane River	2850	98	Apr-Sept	2427	-	3418	2910
at Post Falls, ID <u>2/</u>	2760	101	Apr-July	2330	-	3275	2733
	2640	102	Apr-June	2199	-	3033	2600
<u>OKANOGAN RIVER SYSTEM **</u>							
Similkameen River	1130	74	Apr-Sept	1474	645	1944	1517
nr. Nighthawk	1070	76	Apr-July	1334	605	1720	1417
	920	77	Apr-June	1138	547	1347	1192
Okanogan River							
nr. Tonasket	1230	72	Apr-Sept	1693	708	2185	1719
	1140	73	Apr-July	1509	644	1836	1565
	980	75	Apr-June	1292	583	1382	1305
<u>METHOW RIVER SYSTEM **</u>							
Methow River	750	74	Apr-Sept		280	1205	1011
nr. Pateros	730	78	Apr-July		246	1047	937
	610	77	Apr-June		217	802	791
<u>CHELAN RIVER SYSTEM</u>							
Chelan River	1050	85	Apr-Sept	1804	599	1466	1237
at Chelan <u>3/</u>	930	86	Apr-July	1618	481	1184	1080
	725	87	Apr-June	1307	403	836	834
Stehekin River	785	87	Apr-Sept		494	1010	904
at Stehekin	680	89	Apr-July		382	787	764
	535	92	Apr-June		311	523	578
Entiat	185	76	Apr-Sept		95	310	241
nr. Ardenvoir	170	78	Apr-July		81	266	218
	140	80	Apr-June		70	190	174
<u>WENATCHEE RIVER SYSTEM</u>							
Wenatchee River	1080	83	Apr-Sept		633	1510	1297
at Plain	970	84	Apr-July		542	1263	1156
	770	85	Apr-June		479	891	903
Wenatchee River	1470	83	Apr-Sept		839	2074	1767
at Peshastin	1330	84	Apr-July		730	1746	1587
	1070	86	Apr-June		753	1238	1250
Stemilt Basin	135*	98	May-Sept			144*	138*
nr. Wenatchee							
Icicle Creek	315	85	Apr-Sept				371
nr. Leavenworth	300	87	Apr-July				342
	245	88	Apr-June				279

* Thousands of Miners' Inches.

** Forecasts made by National Weather Service, River Forecast Center, Portland, OR.

*** Forecasts made by Jack A. Wilson, Soil Conservation Service, Boise, Idaho.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage in Lake Chelan.

Basin, Stream and Station	Forecast Runoff 1979	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1978	1977	1976	15-Yr. Average 63-77
YAKIMA RIVER SYSTEM							
Yakima River	135	93	Apr-Sept	106	78	157	145
nr. Martin <u>4/</u>	125	94	Apr-July	92	67	141	133
	110	96	Apr-June	83	67	117	114
Yakima River	955	90	Apr-Sept	911	493	1091	1062
at Cle Elum <u>5/</u>	890	92	Apr-July	726	416	980	970
	800	95	Apr-June	636	379	807	838
Yakima River	1880	86	Apr-Sept	2059	802	2521	2168
nr. Parker <u>6/</u>	1720	88	Apr-July	1691	657	2205	1954
	1490	88	Apr-June	1487	611	1810	1693
Kachess River	115	91	Apr-Sept	101	61	142	126
nr. Easton <u>7/</u>	110	92	Apr-July	95	55	131	119
	100	96	Apr-June	88	53	109	104
Cle Elum River	430	90	Apr-Sept	411	250	561	479
nr. Roslyn <u>8/</u>	395	91	Apr-July	369	215	484	435
	330	92	Apr-June	314	193	370	358
Bumping River	120	82	Apr-Sept	117	63	175	146
nr. Nile <u>9/</u>	110	83	Apr-July	105	55	152	133
	90	85	Apr-June	89	51	109	106
American River	110	87	Apr-Sept		50	132	127
nr. Nile	100	86	Apr-July		44	116	116
	85	89	Apr-June		39	86	95
Tieton River	210	83	Apr-Sept	238	128	302	252
at Tieton Dam <u>10/</u>	180	85	Apr-July	196	92	242	212
	145	86	Apr-June	156	76	179	168
Naches River	760	85	Apr-Sept	760	327	1046	890
nr. Naches <u>11/</u>	690	86	Apr-July	657	275	908	802
	610	90	Apr-June	564	245	717	678
Ahtanum Creek	40	85	Apr-Sept		8	51	47
nr. Tampico <u>12/</u>	35	83	Apr-July		7	45	42
	30	81	Apr-June		6	37	37

4/ Observed flow corrected for storage in Lake Keechelus.

5/ Observed flow corrected for storage in Keechelus, Kachess, and Cle Elum Lakes and diversion by Kittitas Canal.

6/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping, and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation, and Sunnyside Canals.

7/ Observed flow corrected for storage in Lake Kachess.

8/ Observed flow corrected for storage in Lake Cle Elum.

9/ Observed flow corrected for storage in Bumping Lake.

10/ Observed flow corrected for storage in Rimrock Lake.

11/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals, and City of Yakima.

12/ Observed flow of North and South Forks (Combined).

Basin, Stream and Station	Forecast Runoff 1979	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1978	1977	1976	15-Yr. Average 63-77
<u>LOWER COLUMBIA RIVER SYSTEM</u>							
Mill Creek	22	122	Apr-Sept		4	30	18
at Walla Walla	21	124	Apr-July		4	30	17
	20	118	Apr-July		4	30	17
Lewis River	1100	85	Apr-Sept	1134	1030	1285	1301
at Ariel <u>13/</u>	950	84	Apr-July	946	832	1130	1131
	850	85	Apr-June	850	763	990	995
Cowlitz River **	1820	86	Apr-Sept		1570	2296	2125
bl. Mayfield Dam	1650	89	Apr-July		1293	1963	1853
	1430	92	Apr-June		1168	1584	1552
Cowlitz River **	2350	85	Apr-Sept	2310	2157	2924	2767
at Castle Rock <u>14/</u>	2050	85	Apr-July	1886	1766	2493	2401
	1700	84	Apr-June	1616	1601	2063	2028
<u>OLYMPIC PENINSULA</u>							
<u>DUNGENESS RIVER SYSTEM</u>							
Dungeness River	150	94	Apr-Sept		97	160	160
nr. Sequim	125	96	Apr-July		75	128	130
	95	99	Apr-June		61	91	96
<u>PUGET SOUND</u>							
<u>SKAGIT RIVER SYSTEM</u>							
Skagit River	1550	65	Mar-August		1155	3003	2532
at Newhalem <u>15/</u>	1760	75	Apr-Sept		728	2943	2356
	1460	74	Apr-July		535	2322	1972
	1180	79	Apr-June		429	1595	1485
<u>ELWHA RIVER SYSTEM</u>							
Elwha River	535	97	Apr-Sept		370	614	553
nr. Port Angeles	440	97	Apr-July		295	492	454
<u>CEDAR RIVER SYSTEM</u>							
Cedar River	80	86	Apr-Sept		55	91	93
nr. Cedar Falls							

13/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

14/ Observed flow corrected for storage in Mayfield Reservoir.

15/ Observed flow corrected for storage in Diablo, Ross and Gorge Reservoirs.

** Forecasts made by National Weather Service, River Forecast Center, Portland, OR.

RESERVOIR STORAGE - 1000 ACRE FEET

BASIN OR STREAM	RESERVOIR	USABLE 1/ CAPACITY	1979	Measured (March 1)		
				1978	1977	Normal*
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	70.5	134.1	17.1	121.6
Columbia	Franklin D. Roosevelt Lake	5232.0	2912.8	2027.3	2937.5	2681.2
Columbia	Banks Lake	714.9	690.8	720.3	714.9	621.3
Okanogan	Conconully Reservoir	13.0	10.0	3.1	8.4	6.7
Okanogan	Salmon Lake	10.5	10.5	6.0	9.5	7.5
Chelan	Lake Chelan	676.1	198.1	194.6	221.8	235.5
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	78.2	148.5	73.8	105.4
Kachess	Kachess Lake	239.0	187.9	195.6	203.8	183.0
Cle Elum	Lake Cle Elum	436.9	80.0	264.2	408.3	280.2
Bumping	Bumping Lake	33.7	8.3	18.2	9.2	8.7
Tieton	Rimrock Lake	198.0	146.4	149.8	129.8	125.3
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir	1404.1	636.1	801.1	659.7	894.0
Skagit	Diablo Reservoir	90.6	85.0	82.9	86.6	85.2
Skagit	Gorge Reservoir	9.8	8.0	8.2	8.1	8.1

^{1/} Based on Active Storage

* 15-yr. average 1963-1977

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about March 1, as percent of the same date in 1978 and 1977 and average of record.

Tributary Basin	No. of Courses Average	1979 Snow Water Expressed as percent of		
		1978	1977	1963-77 Avg.
<u>UPPER COLUMBIA BASIN</u>				
Pend Oreille	15	91	364	93
Kettle	16	72	224	82
Colville	5	95	518	107
Spokane	12	113	351	102
Okanogan	38	66	235	72
Methow	6	40	632	53
Chelan	4	62	257	80
Entiat	11	58	337	73
Wenatchee	11	110	541	105
Yakima	26	94	921	95
Ahtanum	2	68	858	82
<u>LOWER COLUMBIA BASIN</u>				
Mill Creek	3	208	1927	126
Klickitat	1	103	733	97
Cowlitz	2	123	1049	88
<u>PUGET SOUND</u>				
White	2	84	570	79
Green	4	447	2321	100
Cedar	7	732	2953	98
Snoqualmie	3	187	1184	140
Skykomish	3	132	910	101
Skagit	16	102	790	85
Nooksack	5	138	465	93
<u>OLYMPIC PENINSULA</u>				
Elwha	1	165	925	91
Dungeness	1	126	976	91
Morse Creek	1	99	430	74

SOIL MOISTURE - MARCH

Drainage Basin and Station	Number	Elev.	Profile Depth	Inches Total Capacity	Soil Moisture Content Inches as of March 1		
					1979	1978	1977
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	-	-	1.9
Trout Creek	3-M	3600	48	7.3	-	3.7	3.4
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	7.3	8.8	7.5
Helmets	17C2M	4400	48	12.0	9.1	8.4	9.4
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	8.1	10.8	6.9

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	Inches Total Capacity	Soil Moisture Content (Inches) as of Oct. 1		
					1978	1977	1976
<u>OKANOGAN</u>							
Salmon Meadows	19A02M	4500	48	5.4	-	-	3.4
Trout Creek	3-M	3600	48	7.3	3.7	3.2	3.4
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	5.9	-	-
Helmers	17C2M	4400	48	12.0	8.2	-	-
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	10.3	6.6	-

PRECIPITATION 1/

Division Average Observations and Departures

Drainage Divisions	FALL		WINTER	
	Sept-Oct Observed	1978 <u>2/</u> Departure	Nov. 1978 - Feb. 1979 Observed	<u>2/</u> Departure
Columbia in Canada	6.29	+1.27	10.93	-2.63
Pend Oreille - Spokane	2.09	-1.95	11.54	-3.48
Northeastern Washington	1.74	-0.73	6.27	-1.84
Southeastern Washington	1.22	-1.29	8.06	-0.71
Central Washington	0.60	-0.37	2.86	-1.72
North Central Washington	2.22	+0.63	3.55	-2.23
Northwest Slope Cascades	9.89	-3.32	38.19	-8.91
Southwest Slope Cascades	6.18	-2.50	23.39	-12.09

Northeastern Washington - Lower Spokane, Colville, Sanpoil and Lower Kettle Drainages.

Southeastern Washington - Touchet, Tucannon and Palouse Drainages.

Central Washington - Yakima, Wenatchee and Chelan Drainages.

North Central Washington - Methow and Okanogan Drainages.

Northwest Slope Cascades - Puget Sound Drainages.

Southwest Slope Cascades - Lower Columbia Drainages.

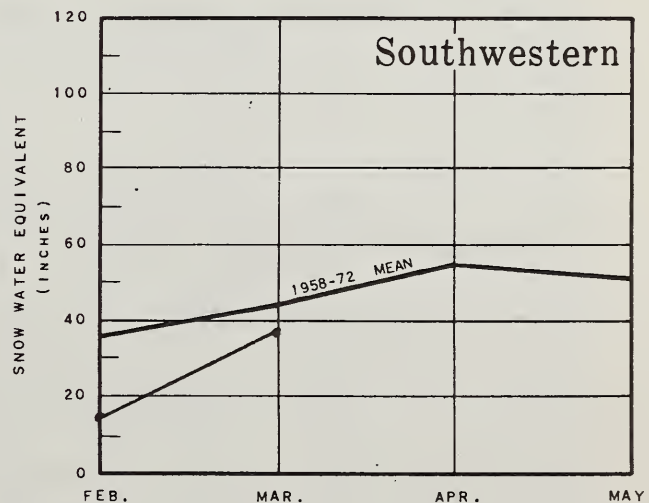
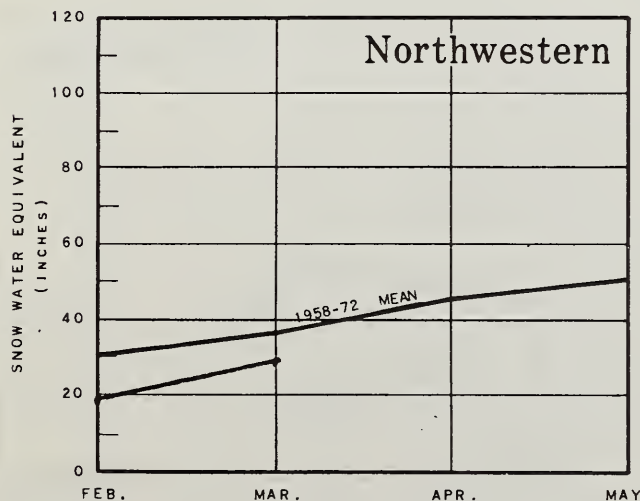
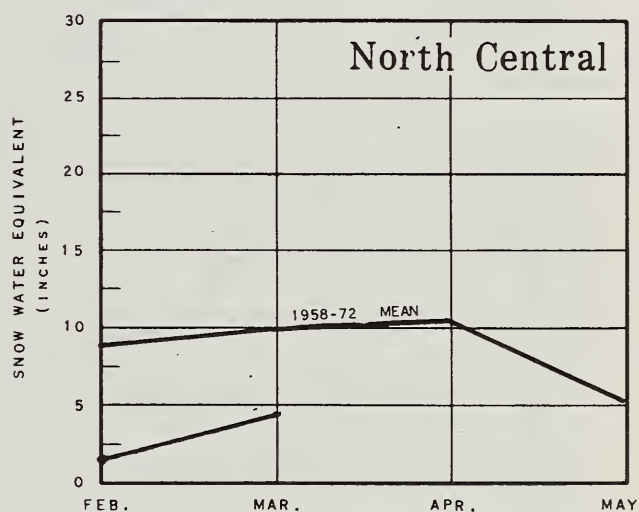
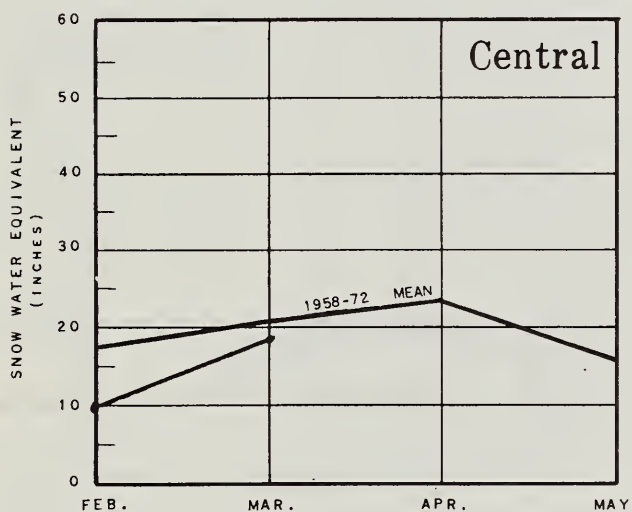
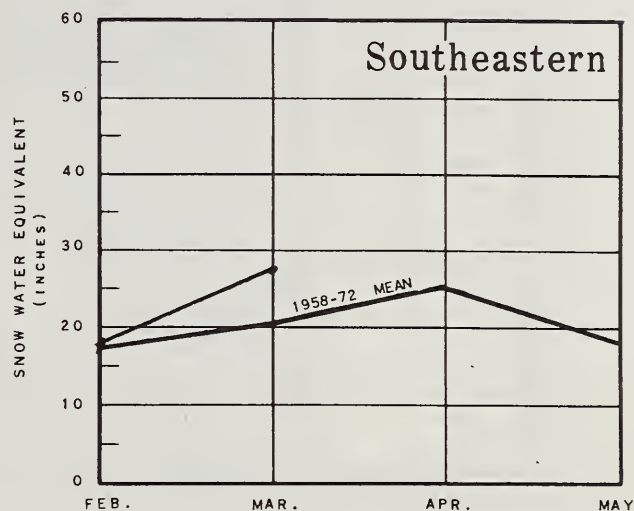
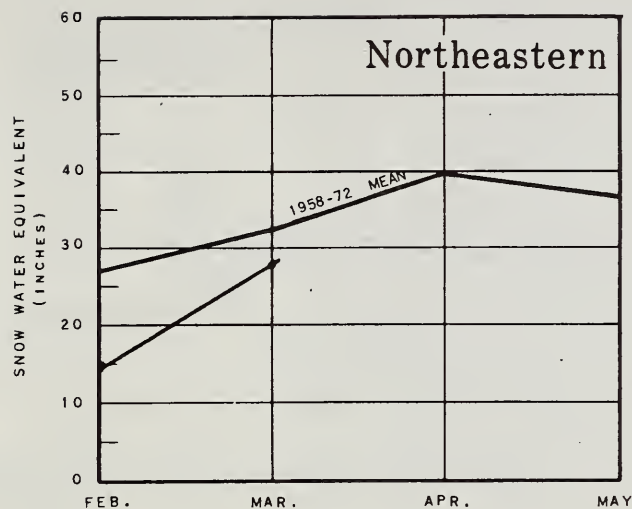
1/ - Preliminary analysis by National Weather Service from data furnished by Meteorological Services of Canada and the National Weather Service.

2/ - Departure from 15-year (1958-72) drainage division average.

WASHINGTON SNOW COVER

1979

DRAINAGE AREAS

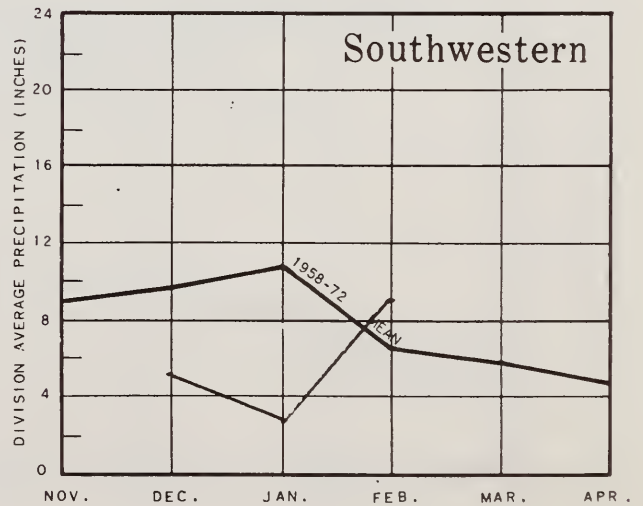
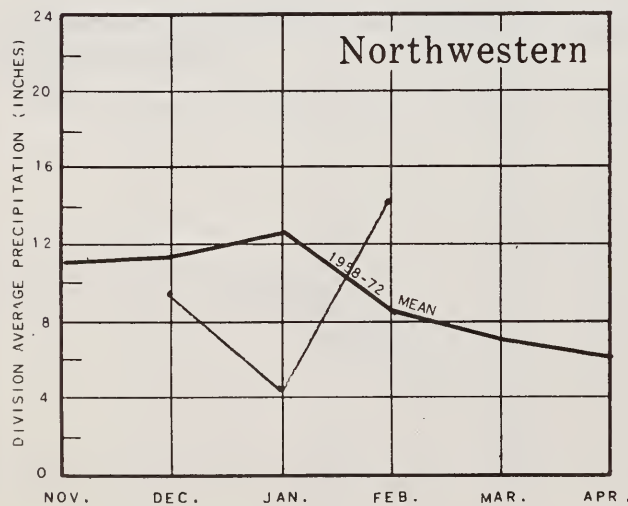
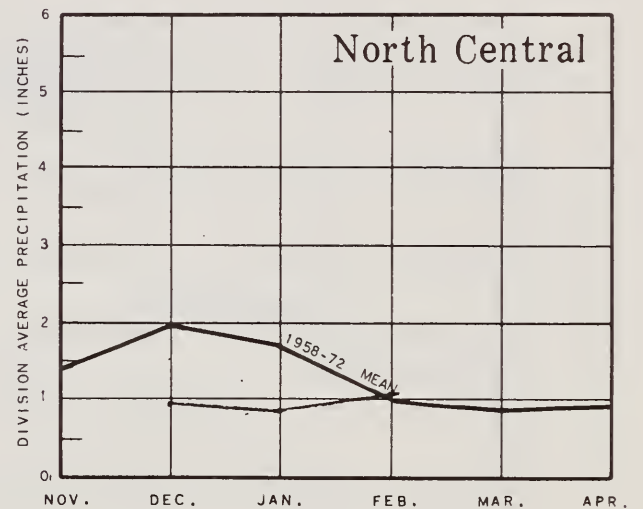
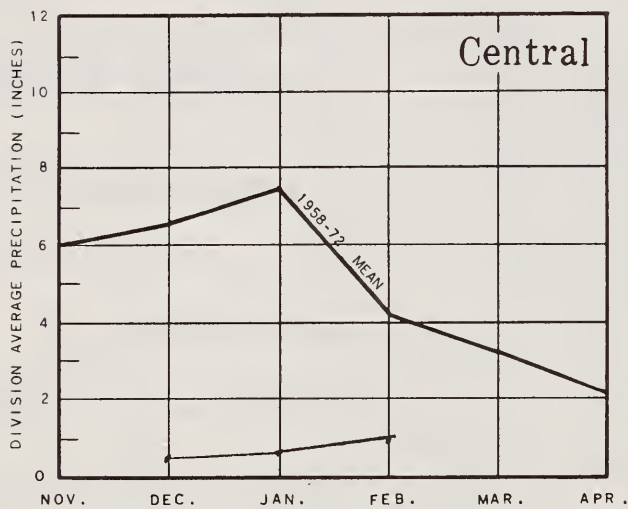
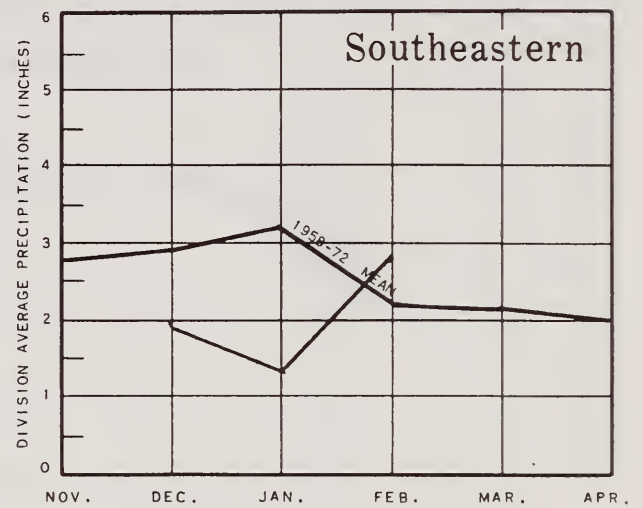
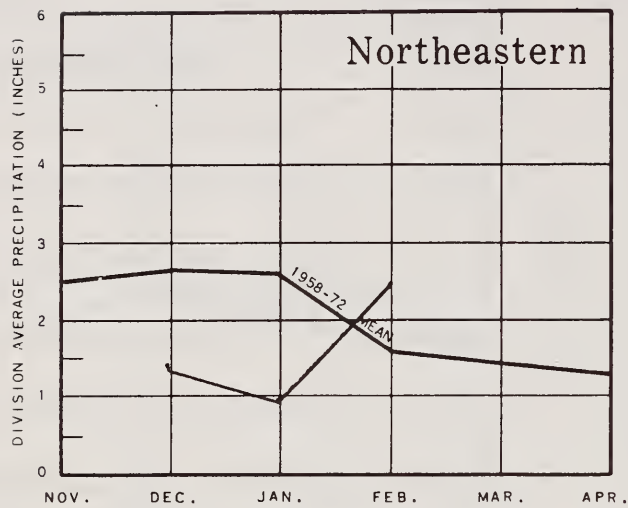


Selected Snow Survey Courses by Soil Conservation Service

WASHINGTON VALLEY PRECIPITATION

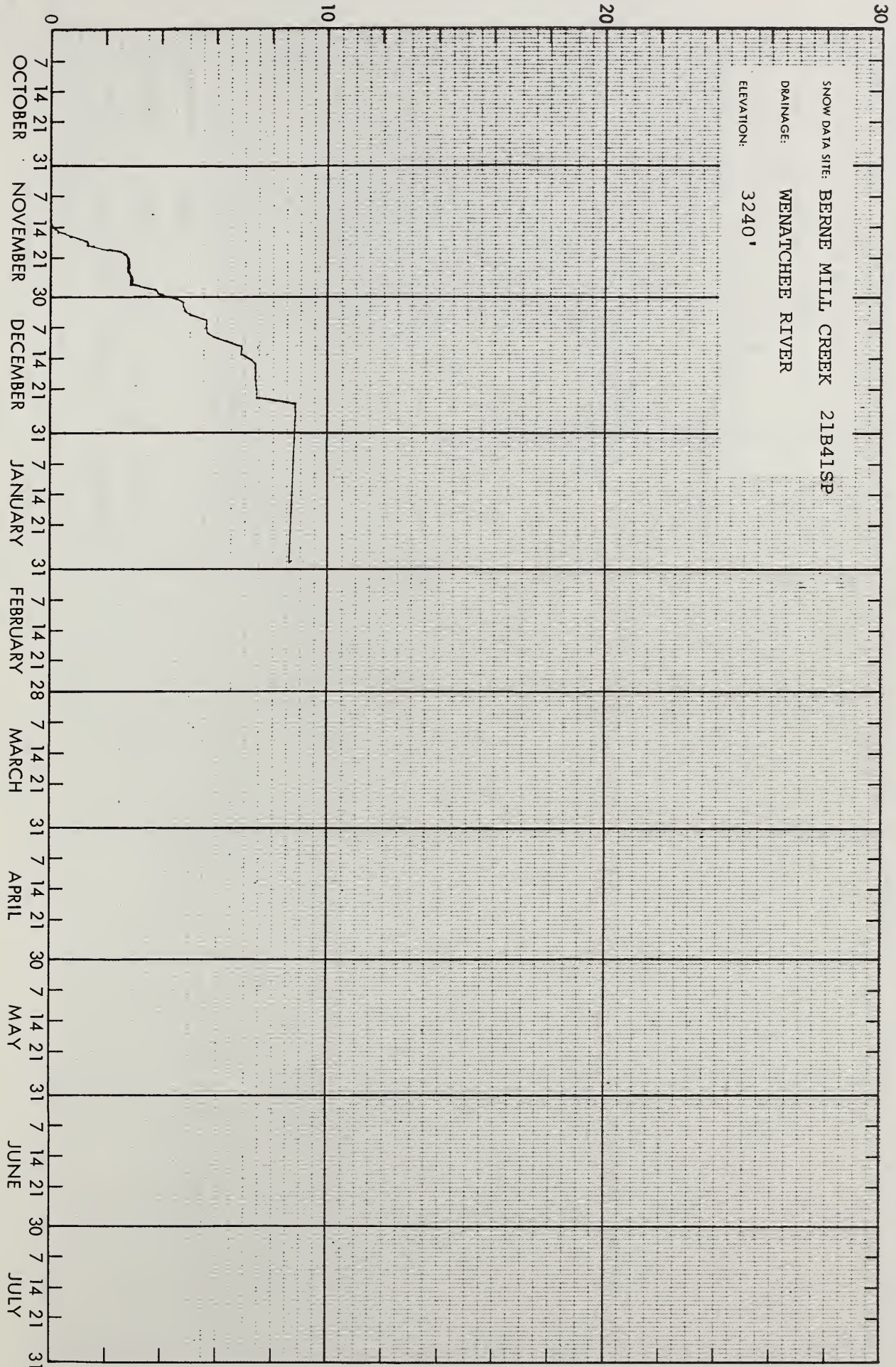
1979

DRAINAGE AREAS



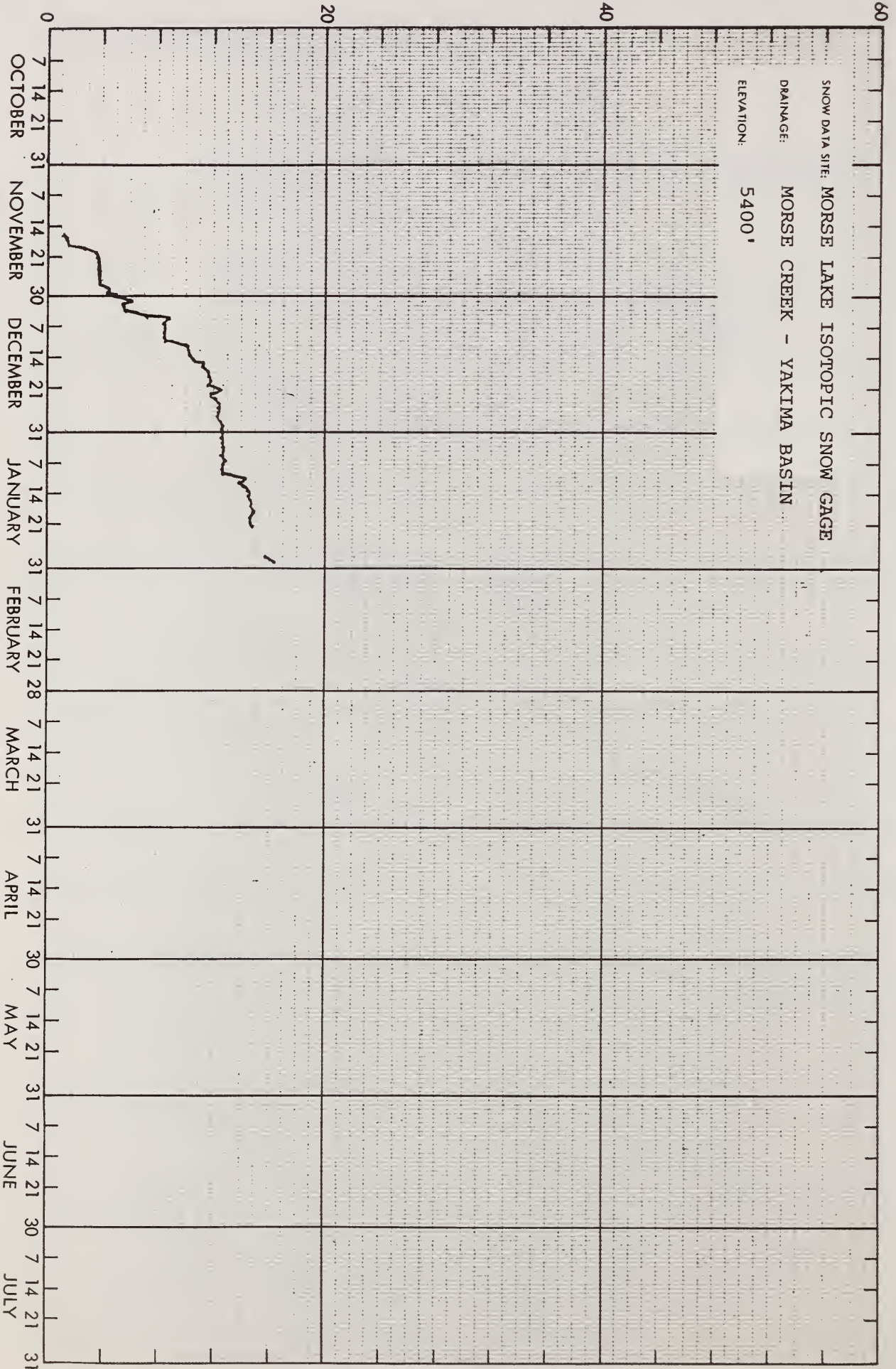
Preliminary Analysis by National Weather Service

INCHES OF WATER IN SNOWPACK

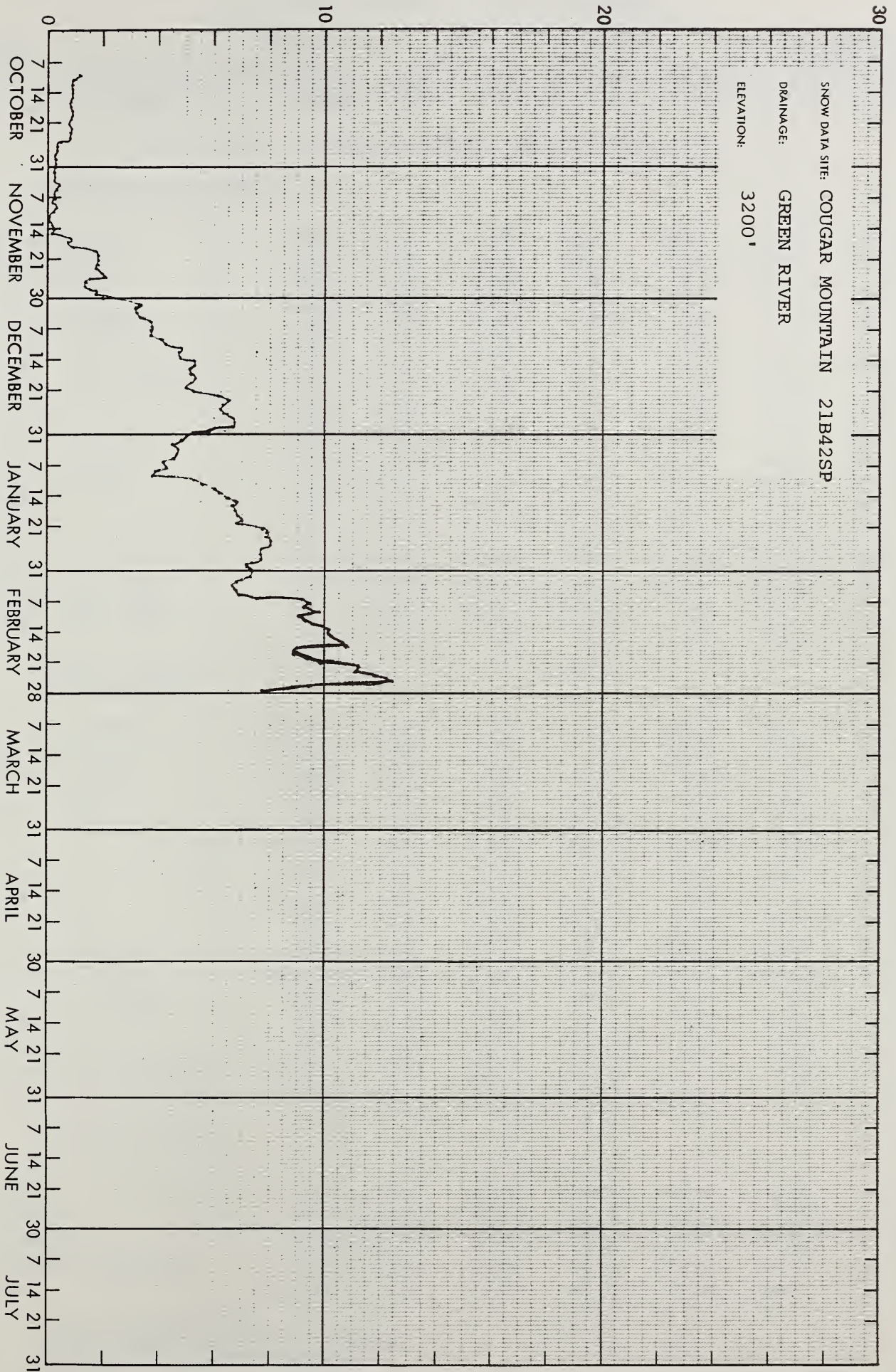


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INCHES OF WATER IN SNOWPACK



INCHES OF WATER IN SNOWPACK



SNOW DATA TO MARCH 1, 1979 - APPENDIX 1

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

U P P E R C O L U M B I A D R A I N A G EPEND OREILLE RIVER

Baree Creek	15B11	5500	2/23	113	36.7	39.0	43.8
Baree Midway	15B16	4600	2/22	101	32.7	31.9	34.0
Baree Trail	15B15	3800	2/22	35	9.7	11.0	10.0
Benton Meadow	16A02	2344	2/26	26	7.0	6.8	6.4
Benton Spring	16A03	4900	2/26	62	17.5	18.0	17.7
Boyer Mountain	17A02	5250	2/27	76	19.8	24.4	23.1
Brush Creek Timber	14A13	5000	2/28	40	11.0	11.0	9.5
Chewelah	17A04	4923	2/25	45	12.0	15.0	14.3
Heart Lake Trail	14C10	4800	2/27	63	23.1	19.8	21.1
Hoodoo Basin	15C10	6000	2/27	123	42.3	46.7	45.4
Hoodoo Creek	15C01	5900	2/27	120	40.2	43.4	42.0
Lookout	15B02	5250	2/28	94	27.8	33.0	31.0
Mosquito Ridge	16A04A	5100	3/2	106	31.4	38.9	34.6
Nelson	19-Can	3050	2/28	53	13.7	15.0	14.5*
Schweitzer Bowl	16A06	4500	3/1	84	24.3	27.1	28.1
Schweitzer Ridge	16A05	6100	3/1	103	30.8	42.2	40.3
Winchester Creek	17A03	2970	2/27	41	9.0	10.0	10.6

KETTLE RIVER

Barnes Creek	90-Can	5300	2/28	57	16.9	16.9	18.0*
Big White Mtn.	154-Can	5500	3/1	51	13.8	17.8	17.4*
Boulder Road	18A02	1450	2/26	17	4.2	5.2	4.5
Butte Creek	18A03	4070	2/26	28	5.8	10.0	8.5
Cabin Creek	18A08	3170	2/26	25	5.9	8.7	7.2
Carmi	126-Can	4100	3/1	22	4.8	7.8	6.4*
Farron # 1	17-Can	4000	2/27	37	8.0	15.0	12.4*
Farron # 2	243-Can	4000	2/27	41	9.6	15.2	12.0*
Goat Creek	18A04	3595	2/26	24	5.4	8.2	6.5
Graystoke Lake	5-Can	5950	2/27	46	12.4	14.2	16.6*
Monashee Pass	48A-Can	4500	2/28	44	11.9	14.3	12.8*
Snow Caps Creek	18A05	2150	2/26	16	4.1	6.0	4.8
Snow Caps Trail	18A06	2720	2/26	21	5.0	7.2	5.8
Summit G.S.	18A07	4600	2/26	21	4.8	8.3	7.3
Trapping Creek Lower	166-Can	3050	3/1	21	4.3	6.5	5.4*
Trapping Creek Upper	165-Can	4450	3/1	37	9.6	10.2	9.4*

COLVILLE RIVER

Baird	17A06	3215	2/25	34	9.5	9.5	6.7
Carlson	18A09	2885	2/25	19	5.3	5.0	4.2
Chewelah	17A04	4925	2/25	45	12.0	15.0	14.3
Stranger Mountain	17A05	4990	2/25	44	11.8	12.6	12.5
Togo	18A10	3370	2/25	40	9.8	10.1	10.8

Average based on 1963-77 average

* Average for years of record

SNOW DATA TO MARCH 1, 1979 - APPENDIX 2

SNOW DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SPOKANE RIVER

Above Burke	15B08	6100	2/28	67	23.6	19.1	22.9
Copper Ridge	16B02	4800	2/28	85	27.7	20.3	25.1
Forty-nine Meadows	15B03	5000	3/1	86	23.4	21.6	27.2
Fourth of July Summit	16B03	3100	3/1	43	12.4	8.0	8.8
Kellogg Peak	16B05A	5560	3/2	86	21.0	32.3	28.2
Lookout	15B02	5250	2/28	94	27.8	33.0	31.0
Lost Lake	15B14A	6000	3/1	130	36.7	42.2	50.0
Lower Sands Creek	16B01	3400	2/27	56	18.5	14.6	17.5
Mosquito Ridge	16A04A	5110	3/2	106	31.4	38.9	34.6
Roland Summit	15B05A	5200	3/2	98	29.0	29.6	31.3
Sherwin	16C01	3200	2/28	49	15.7	8.8	13.3
Sunset	15B09A	5600	3/2	114	32.3	41.6	32.6

OKANOGAN RIVER

Aberdeen Lake	6A-Can	4300	3/1	25	5.1	8.4	6.1*
Blackwall Mountain	100-Can	6250	2/28	74	21.7	26.4	31.2*
Bouleau Lake	234-Can	4580	2/24	41	9.7	13.7	11.7*
Brenda Mine	193-Can	4800	2/27	40	10.5	13.9	13.0*
Brookmere	27-Can	3200	2/26	26	6.5	10.5	9.0*
Carrs Landing Upper	168-Can	3200	2/27	18	4.1	7.0	4.7*
Enderby	130-Can	6250	2/26	72	22.1	35.3	33.0*
Esperon Creek Lower	164-Can	4400	2/25	35	7.9	12.1	11.2*
Esperon Creek Middle	163-Can	4700	2/25	43	10.6	13.2	13.8*
Esperon Creek Upper	162-Can	5400	2/25	46	12.3	16.2	16.9*
Graystoke Lake	5-Can	5950	2/27	46	12.4	14.2	16.6*
Hamilton Hill	107-Can	4900	2/23	43	11.8	17.3	14.3*
Harts Pass	20A05A	6500	2/27	105	29.3	41.8	41.1
Horseshoe Basin +	19A05a	7000	2/28	48	12.0	-	16.3
Isintok Lake	152-Can	5510	2/25	27	6.3	9.7	7.9*
Loup Loup	19A07	4650	2/26	19	4.1	10.9	8.8
McCulloch	4-Can	4200	2/25	30	6.3	7.5	6.4*
Missezula Mountain	106-Can	5100	2/24	30	7.5	11.8	9.2*
Mission Creek	5A-Can	6000	2/27	53	14.6	18.1	17.7*
Monashee Pass	48A-Can	4500	2/28	44	11.9	14.3	12.8*
Mount Kobau	156-Can	5950	2/27	20	3.7	11.1	11.5*
Muckamuck +	19A09a	6390	2/28	38	7.6	16.5	14.7
Mutton Creek No. 1	19A01	5700	2/26	24	4.7	14.7	12.7
Mutton Creek No. 2 SP	19A11	6000	2/26	-	3.6	15.0	10.0
New Copper Mountain	46A-Can	4300	2/27	25	4.7	5.5	5.7*
New Penticton Res. #2	183-Can	5225	2/28	31	6.3	9.1	8.2*
Nickel Plate Mtn.	47-Can	6200	2/27	28	6.7	8.3	7.2*

Average based on 1963-77 average

* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO MARCH 1, 1979 - APPENDIX 3

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

OKANOGAN RIVER (Cont.)

Oyama Lake	203-Can	4400	2/26	26	6.1	8.3	6.9*
Paysayten +	20A28a	4300	2/28	51	12.8	16.2	16.9
Postill Lake	55-Can	4500	2/28	31	7.3	8.5	7.6*
Quartette Lake	34-Can	4000	2/26	41	9.8	9.8	8.9*
Rusty Creek	19A03	4000	2/27	17	3.7	9.7	6.6
Salmon Meadows	19A02	4500	2/26	22	4.4	11.2	9.1
Silver Star Mountain	99-Can	6050	2/25	55	15.4	28.9	24.6*
Starvation Mtn. +	19A10a	6750	2/28	42	8.4	20.1	17.5
Summerland Reservoir	3A-Can	4200	2/24	34	8.3	10.2	9.1*
Touts Coulee	19A06	2845	2/27	7	1.3	4.5	3.5
Trout Creek	3-Can	4700	2/27	30	6.4	8.1	6.6*
Vaseux Creek	233-Can	4600	2/24	21	3.6	5.3	6.8*
White Rocks Mountain	70-Can	6000	2/26	54	16.6	26.9	19.8*

METHOW RIVER

Billy Goat Pass +	20A10a	6409	Not Measured			-	31.3
Dollar Watch +	20A29a	7000	Not Measured			-	27.0
Harts Pass	20A05A	6500	2/27	105	29.3	41.8	41.1
Horseshoe Basin +	19A05a	7000	2/28	48	12.0	-	16.3
Loup Loup	19A07	4650	2/26	19	4.1	10.9	8.8
Mutton Creek No. 1	19A01	5700	2/26	24	4.7	14.7	12.7
Mutton Creek No. 2 SP	19A11	6000	2/26	-	3.6	15.0	10.0
Rusty Creek	19A03	4000	2/27	17	3.7	9.7	6.6
Salmon Meadows	19A02	4500	2/26	22	4.4	11.2	9.1
War Creek Pass +	20A31a	6500	Not Measured			-	42.9

CHELAN LAKE BASIN

Cloudy Pass +	20A22a	6500	2/28	103	31.1	56.6	35.0
Little Meadows +	20A24a	5275	2/28	118	35.6	51.2	37.6
Lyman Lake	20A23A	5900	2/28	126	38.2	-	49.8
Park Creek Ridge	20A12A	4600	2/28	104	31.3	50.8	44.2
Rainy Pass	20A09	4780	2/27	98	26.0	41.1	37.0

ENTIAT RIVER

Blue Creek G.S.	20B28a	5425	2/27	104	28.1	49.2	33.8
Brief	20B19	1600	2/25	35	9.4	9.9	7.5
Entiat Meadows +	20A33a	4540	2/27	102	27.5	51.7	57.7
Entiat River Trail +	20A34a	3325	2/27	70	18.9	29.5	25.6
Four Mile Ridge +	20B27a	6800	2/27	60	16.2	40.2	28.4
Fox Camp +	20A36a	6510	2/27	122	32.9	69.7	52.9
Pope Ridge	20B20	3540	2/27	56	14.9	24.8	18.2

Average based on 1963-77 average

* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO MARCH 1, 1979 - APPENDIX 4

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

ENTIAT RIVER (Cont.)

Pugh Ridge +	20A32a	6725	2/27	81	21.9	40.6	40.8
Shady Pass	20A37	6200	2/28	69	18.4	34.4	23.7
Snow Brushy +	20A35a	3910	2/27	93	25.1	46.4	35.8
Tommy Creek +	20B21a	4900	2/27	68	18.4	32.8	26.5

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	2/13	69	20.2	28.0	24.5
			2/28	85	27.8	27.7	26.0
Berne-Mill Creek New SP	21B41	3240	2/28	79	26.6	23.2	24.0
Blewett Pass No. 2	20B02	4270	2/23	54	15.0	16.8	15.0
Chiwaukum G.S.	20B16	1810	2/13	37	8.8	12.4	11.0
			2/27	44	11.4	11.6	11.6
Fish Lake	21B04	3371	2/28	92	19.8	28.5	31.1
Lake Wenatchee	20B05	1970	2/13	46	13.6	16.9	13.5
			2/27	53	16.0	17.0	14.4
Leavenworth R.S.	20B17	1127	2/13	24	6.8	6.4	5.5
			2/27	26	8.1	3.3	4.4
Lyman Lake	20A23A	5900	2/28	126	38.2	-	49.8
Merritt	20B18	2140	2/13	51	15.8	19.6	15.5
			2/27	62	17.0	19.1	15.8
Stevens Pass	21B01	4070	2/13	108	32.3	45.2	43.5
			2/27	130	46.0	45.7	48.0
Stevens Pass Sand Shed	21B45	3700	2/13	85	25.5	33.6	32.1
			2/27	104	35.0	33.5	34.9

SQUILCHUCK CREEK

Beehive Springs	20B03	4400	2/27	30	8.0	11.8	8.1
Scout-A-Vista	20B04	3400	2/27	30	7.7	12.7	8.2

STEMILT CREEK

Jump-Off	20B08	4450	2/26	38	11.0	14.0	8.4
Stemilt Slide	20B06	5000	2/26	52	13.4	17.4	13.1
Upper Wheeler	20B07	4400	2/26	37	10.9	12.3	9.7

COLOCKUM CREEK

Colockum Creek Upper	20B22	5300	2/26	36	10.4	16.0	13.3
Colockum Creek Lower	20B23	4300	2/26	36	10.3	13.3	10.1
Trough # 2 SP	20B25	5310	2/26	43	12.0	19.0	New

Average based on 1963-77 average

+ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO MARCH 1, 1979 - APPENDIX 5

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

YAKIMA RIVER

Ahtanum R.S.	21C11	3100	2/26	21	5.4	9.0	6.7
Big Boulder Creek	21B09	3200	2/27	64	19.4	15.3	19.3
Blewett Pass No. 2	20B02	4270	2/23	54	15.0	16.8	15.0
Bumping Lake	21C08	3450	2/14	29	7.5	12.8	14.8
			3/1	42	11.0	14.1	20.4
Bumping Lake New	21C36	3400	2/14	36	11.5	15.6	18.5
			3/1	54	14.8	16.8	20.2
Cayuse Pass	21C06	5300	2/28	169	55.7	-	71.0
Colockum Pass	20B09	5370	2/22	42	11.6	22.0	14.2
Cooke Creek	20B10	4123	2/22	23	5.4	6.4	5.7
Corral Pass	21B13	6000	2/28	93	29.7	30.0	35.1
Fish Lake	21B04	3371	2/28	92	19.8	28.5	31.1
Green Lake	21C10	6000	2/26	77	24.2	32.2	29.6
Grouse Camp	20B11	5385	2/23	49	14.2	19.5	15.5
High Creek	20B12	2930	2/23	26	6.8	6.9	6.1
Joe Lake +	21B46a	4624	2/19	156	53.0	-	53.5
Lake Cle Elum	21B14M	2200	2/13	32	9.6	7.2	9.2
			3/1	32	10.5	7.0	9.2
Lemah Creek +	21B47a	3327	2/19	99	33.7	37.6	41.9
Manashtash	20C01	3935	2/26	21	5.3	8.5	4.3
Morse Lake	21C17	5400	2/28	123	35.4	50.8	47.2
Nanum	20B13	2340	2/23	35	8.5	8.3	9.8
Olallie Meadows	21B02	3625	2/28	109	39.2	23.3	44.8
Satus Pass	20D01	4030	2/28	26	8.8	8.5	9.1
Stampede Pass SP	21B10	3860	2/15	96	32.8	41.6	36.2
			3/1	113	40.7	40.3	35.7
Trail Creek	20B14	3360	2/22	20	5.0	0.0	2.6
Tunnel Avenue	21B08	2450	2/15	47	14.6	13.6	19.9
			3/1	62	19.3	14.1	21.6
Van Epps Pass +	20B26a	5925	2/19	104	35.4	38.8	43.0
Walters Flat	20B15	3360	2/23	30	7.4	7.9	7.1
Waptus Lake +	21B49a	3024	2/19	93	42.8	30.8	41.4
White Pass (E. Side)	21C28	4500	2/14	58	16.2	17.0	21.0
			3/1	70	22.6	18.4	23.1

AHTANUM CREEK

Ahtanum R.S.	21C11	3100	2/26	21	5.4	9.0	6.7
Green Lake	21C10	6000	2/26	77	24.2	32.2	29.6

Average based on 1963-77 average

+ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO MARCH 1, 1979 - APPENDIX 6

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

U P P E R C O L U M B I A D R A I N A G EASOTIN CREEK

Spruce Springs	17C04	5700	2/26	77	22.7	16.8	22.6
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MILL CREEK

Homestead	17C01	4030	2/21	41	10.8	5.9	8.2
Martin Springs	17C02	4400	2/21	52	14.8	8.7	12.1
Tollgate	18D3M	5070	2/28	85	27.7	10.2	22.1

KLICKITAT RIVER

Satus Pass	20D01	4030	2/28	26	8.8	8.5	9.1
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COWLITZ RIVER

Cayuse Pass	21C06	5300	2/28	169	55.7	-	71.0
White Pass (E. Side)	21C28	4500	2/14	58	16.2	17.0	21.0
			3/1	70	22.6	18.4	23.1

P U G E T S O U N D D R A I N A G EWHITE RIVER

Cayuse Pass	21C06	5300	2/28	169	55.7	-	71.0
Corral Pass	21B13	6000	2/28	93	29.7	30.0	35.1
Morse Lake	21C17	5400	2/28	123	35.4	50.8	47.2

GREEN RIVER

Airstrip	21B24	1800	2/28	14	5.0	0.3	5.1
Cougar Mountain SP	21B42	3200	2/28	60	21.9	-	20.9
Lester Creek	21B29	3100	2/28	72	21.8	9.9	21.7
Sawmill Ridge	21B31	4700	2/28	97	29.3	23.0	33.7
Snowshoe Butte SP	21B43	5000	2/28	134	46.0	38.0	52.7
Stampede Pass SP	21B10	3860	2/15	96	32.8	41.6	36.2
			3/1	113	40.7	40.3	35.7
Twin Camp	21B30	4100	2/28	78	24.4	-	22.3

CEDAR RIVER

City Cabin	21B03	2390	3/1	43	14.0	0.9	17.2
Mt. Gardner	21B21	3300	2/28	56	18.2	0.0	18.7
Mt. Lindsay	21B16	2500	2/28	49	15.0	0.0	15.1
Mt. Washington New	21B15	3000	2/28	28	10.1	0.0	8.8
Rex River	21B17	2400	2/28	57	17.5	0.0	12.7
S. F. Cedar	21B06	3000	3/1	46	14.3	3.6	19.7
Tinkham Creek	21B20	3400	3/1	59	18.9	7.7	22.9

Average based on 1963-77 average

SNOW DATA TO MARCH 1, 1979 - APPENDIX 7

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SNOQUALMIE RIVER

Alpine Meadow	21B48	3500	2/27	113	40.1	20.0	41.2
Lake Elizabeth	21B19	2900	3/1	114	40.1	21.0	37.7
Olallie Meadows	21B02	3625	2/28	109	39.2	23.3	44.8
S. F. Tolt	21B18	1900	2/27	24	8.6	0.0	3.2

SKYKOMISH RIVER

Lake Elizabeth	21B19	2900	3/1	114	40.1	21.0	37.7
Stevens Pass	21B01	4070	2/13	108	32.3	45.2	43.5
			2/27	130	46.0	45.7	48.0
Stevens Pass Sand Shed	21B45	3700	2/13	85	25.2	33.6	32.1
			2/27	104	35.0	33.5	34.9

SKAGIT RIVER

Beaver Creek Trail	21A04	2200	2/26	47	13.0	12.4	14.9
Beaver Pass	21A01	3680	2/26	69	19.1	23.6	28.7
Brown Top Ridge +	21A28a	6000	2/27	122	34.4	50.0	61.2
Cloudy Pass +	20A22a	6500	2/28	103	31.1	46.7	35.0
Devils Park	20A04	5900	2/27	106	29.0	39.2	41.3
Freezeout Creek Trail	20A01	3500	2/26	46	11.3	10.0	12.7
Freezeout Meadows New	20A38	5000	2/26	100	29.0	22.4	42.5
Granite Creek	21A29A	3500	2/27	60	15.2	14.9	19.2
Harts Pass	20A05A	6500	2/27	105	29.3	41.8	41.1
Klesilkwa	35B-Can	3700	2/28	45	13.1	9.1	12.7*
Lyman Lake	20A23A	5900	2/28	126	38.2	-	49.8
Meadow Cabins	20A08	1900	2/28	32	10.6	6.2	7.4
New Hozomeen Lake	21A30	2800	2/26	40	10.6	8.8	14.2
New Tashme	26A-Can	2500	2/27	37	11.7	9.5	11.2*
Quartette Lake	34-Can	4000	2/26	41	9.8	9.8	8.9*
Rainy Pass	20A09	4780	2/27	98	26.0	41.1	37.0
Thunder Basin	20A07	4200	2/28	68	19.1	17.2	20.9

Average based on 1963-77 average

* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO MARCH 1, 1979 - APPENDIX 8

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

BAKER RIVER

Dock Butte +	21A11A	3800	Not Measured			48.0	47.4
			2/28	144	58.0	38.0	64.2
Easy Pass +	21A07A	5200	2/14	96	38.0	62.0	51.7
			2/28	130	52.0	57.0	71.3
Jasper Pass +	21A06A	5400	2/14	148	59.0	68.0	66.5
			2/28	178	71.0	64.0	82.5
Marten Lake +	21A09A	3600	Not Measured			48.0	55.4
			Not Measured			45.0	71.8
Mount Blum +	21A18a	5800	Not Measured			50.0	48.4
			2/28	115	46.0	48.0	62.1
Panorama New	21A26	4300	2/11	83	27.2	48.4	56.8
			2/23	113	40.3	49.1	66.0
Rocky Creek +	21A12A	2100	2/14	40	29.0	12.0	24.7
			2/28	90	36.0	7.0	30.4
Schreibers Meadow +	21A10A	3400	2/14	118	47.0	36.0	41.0
			2/28	172	69.0	28.0	54.5
S. F. Thunder Creek +	21A14A	2200	Not Measured			0.0	10.0
			2/28	30	12.0	0.0	11.7
Watson Lakes +	21A08A	4500	Not Measured			40.0	44.4
			2/28	132	53.0	28.0	60.9

NOOKSACK RIVER

Bald Mountain +	21A19a	4400	3/2	120	43.2	27.7	46.2
Canyon +	21A20a	5100	3/2	116	41.8	49.6	58.1
Glacier Creek	21A23	3700	2/26	64	23.1	9.4	15.1
Panorama New	21A26	4300	2/11	83	27.2	48.4	56.8
			2/23	113	40.3	49.1	66.0
Twin Lakes +	21A21a	5200	3/2	164	59.0	47.2	70.4

O L Y M P I C P E N I N S U L ADUNGENESS RIVER

Deer Park	23B04	5200	2/23	58	16.6	13.2	18.3
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MORSE CREEK

Cox Valley	23B14	4500	2/24	97	27.1	27.4	36.5
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ELWHA RIVER

Hurricane	23B03	4500	2/26	75	18.5	11.2	20.3
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Average based on 1963-77 average

+ Snow water equivalent estimated from aerial stadia observation

Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers
U. S. Department of Agriculture
Forest Service
U. S. Department of Commerce
NOAA, National Weather Service
U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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